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ABSTRACT

To develop and test materials to be used in a later 2-year study to compare six approaches in teaching braille reading, materials in grade 1 and grade 2, braille, and phonemic braille media (both analytic and synthetic approaches), 39 subjects from six residential schools were evaluated. Special books were embossed in grade 1 and phonemic braille, and phonemic codes were prepared for use with the analytic and synthetic readers. The teachers were given a 3-day workshop preceding the program. They made daily progress reports and their reactions were used in the evaluation of each approach. At the end of the 1-year program the results indicated that phonemic braille could be used with beginning braille readers; the analytic approach appeared to function more effectively for the phonemic materials than the synthetic approach; grade 1 approaches were not adequately measured; and further research is necessary with development of more adequate materials utilized to make generalizations concerning approaches in braille reading. (Author/JM)

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SUMMARY

The present study was undertaken to develop and to field test materials to be used in a large two-year study to compare six approaches in teaching braille reading to blind children. Materials in two braille media--grade 1 and phonemic--were developed and tested along with the traditional grade 2 system in two basal readers using contrasting approaches--analytic and synthetic. The 39 subjects were located in six classes in six residential schools for the blind.

Visual acuity ranged from 20/200 to total blindness and chronological age from five to ten years. Intellectual ability of the subjects as measured by the Interim Hayes Binet ranged from mildly retarded to high average, but there were no significant differences in mental age among the four groups used in the final analysis. The grade 1 groups were not compared due to possible unreliability of reading scores from one of the groups.

Special books were embossed in grade 1 and phonemic braille. Special phonemic codes were prepared for use with the analytic and synthetic readers.

Teachers were prepared in a three day workshop preceding the start of the school program. The experimental materials were introduced to subjects following a readiness program in each group. A daily progress record was kept by each teacher, and periodic reports were made of special problems encountered in the use of the reading materials. Teacher reactions were used in the evaluation of each approach.

Results of the Slosson Oral Reading Test and the Gilmore Oral Reading Test administered at the end of the academic year indicated that phonemic braille could be used successfully with these beginning braille readers. The analytic approach appeared to function more effectively for the phonemic materials than the synthetic approach. The effectiveness of the grade 1 approaches was not adequately measured. A study of longer duration with more subjects and more adequate materials is necessary to make generalizations concerning the efficacy of approaches in braille reading.

Chapter I. Introduction

A. Problem

The over-all purpose of this investigation was to determine the most effective approach to the teaching of beginning reading to blind children. During the pilot study, or period of this report, materials in three braille media - grade 1, grade 2, and phonemic - and two basal readers using contrasting approaches were to be prepared and studied for use in a more extensive study with a larger sample.

An examination of the literature reveals a paucity of research in the study of approaches to the teaching of braille reading to blind children. One approach is being used in education of blind children which was actually adopted by consensus without proof of its effectiveness. Research has been conducted to investigate the most effective approach in teaching reading to normal children. It seemed appropriate that a study should be made to examine the effectiveness of several unique approaches to the teaching of braille reading to blind children.

B. Review of Related Research

There is very little research to indicate that the present mode of teaching braille reading to blind children by starting with grade 2 is the most effective procedure. Ashcroft (1960) has noted that the space saving efforts used in grade 2 braille contribute substantially to the reading difficulty encountered. These features included such factors as assignment of several meanings to the same braille symbol, extensive abbreviation of words and the use of contractions to represent from one to five letters with from one to two symbols. A first grade blind pupil must learn most of grade 2 in order to read the present first grade books that are embossed in braille. Hooper (1946) noted in a study of 21 series of reading books that the majority of signs, abbreviations and contractions of Standard English Braille were employed in the reading vocabularies of children in the first grade of school.

Although insufficient research was done to give positive justification to the shift to grade 2, the shift was made gradually against the wishes of some of the profession. Langan (1950) reported results of an opinion survey of teachers which indicated considerable disagreement concerning the level at which grade 2 is best introduced: whether to eliminate the progression from grade 1 through grade 1-1/2, and then into grade 2. Irwin (1955) indicated that the adoption of grade 2 for primary children was resisted at first but was gradually extended downward into the lower grades by the American Printing House for the Blind until in 1950 few books except for children in the first grade were published in grade 1-1/2. Ashcroft (1960) indicated that the schools and classes in the nation have moved solely to the use of grade 2 braille without any conclusive research to indicate that this method was better than any other method.

The Illinois Braille Series (1963) is used with newly blinded adults in several rehabilitation centers. This series starts with grade 1 (alphabet) and proceeds to grade 2 (highly contracted) using some books in grade 1, some in grade 1-1/2 (moderately contracted), and some in grade 2. This series, now available from the American Printing House for the Blind, has been used with both adolescent and adult learners.

The results of research with blind children by Nolan, Morris, and Kederis (1965) indicated little resemblance between the dynamics of the braille reading process to those of print reading. They reported that although print reading involved the perception of large wholes, braille reading consisted of a sequential integrative synthesis of the dots. It was found that contracted braille words were generally more difficult to recognize than uncontracted words. The results indicated that increasing the number of contractions in a word adds to the difficulty of recognition. A synthetic approach to teaching of reading might be indicated by the results of this series of studies.

Lowenfeld, Abel, and Hatlen (1969) found considerable uniformity of reading methods among teachers of blind children in residential and day school programs. They found that two-thirds of the teachers started with the word or sentence method whereas one-third of them began braille reading instruction with the braille alphabet. However, many teachers using the alphabet method switched to the word method soon after the letters were learned. Ninety-six per cent of the residential schools and 94 per cent of the local schools used braille grade 2 from the beginning.

An elemental approach in teaching reading to the educable mentally retarded has been recommended by Dunn (1963). He recommended a sequence of steps in this order: "Listening comprehension for instruction and stories, auditory discrimination of familiar sounds and then speech sounds, sound blending ability, visual discrimination for individual letters, association of sounds with individual letters, word-attack skills". In a study of mentally retarded and mentally normal boys of the same age, Dunn (1954) found that the mentally retarded group was deficient in the use of phonetic word attack skills and in the speed of recognition of words and phrases. A study by Woodcock (1967) was conducted to compare the efficacy of several approaches for teaching reading to young educable mentally retarded pupils in which a phonemic alphabet was used as one approach. No significant differences in reading achievement were noted among any of the approaches at the end of two years of the study.

C. Description of Approaches

Three selected braille media for the teaching of reading to blind children were demonstrated and evaluated. These media were grade 1, grade 2 and phonemic braille.

Grade 1 braille is currently being used with newly blinded adolescents and adults. The braille equivalents for the 26 letter alphabet (grade 1) are first introduced. Later, selected space saving forms are introduced. Finally, all of the abbreviations and contractions of grade 2 braille are learned (Illinois Braille Series, 1963).

Grade 2 braille is now being used with blind children. All basal readers produced at the American Printing House for the Blind are produced in grade 2 braille. Contractions, abbreviations and whole word forms are introduced immediately. Books are copied into braille directly from print editions without any adaptations allowing for planned introduction of the special braille forms.

A phonemic alphabet, ITA, was developed in print by Pitman (Downing, 1964) using the augmented Roman alphabet. This approach, which uses a phonetically consistent 44 element alphabet, is a two-stage approach to the teaching of reading. The child first learns to read and write using the basic 44 characters. After learning to read and write these symbols, he makes a transition to reading words constructed with the traditional 26 letter alphabet. A phonemic alphabet offers certain advantages over traditional orthography in print. Letters always have the same shape and sounds and written symbols have a consistent relationship. In braille, letters always have the same shape (capital letters are made by prefixing the braille letter with a "capital dot" symbol). The advantage of a phonemic alphabet in braille is consistency in sound-to-symbol relationship.

In order to conserve space, braille symbols have been assigned multiple meanings which depend on position within the braille cell, and on the context of the symbol in the reading material. Contractions may stand for from two to five letters. Abbreviations and symbols for whole words add to the complexity of the problem. A comparison of grade 1, grade 2 and a phonemic alphabet (ITA) is illustrated in Table 1.

Table 1
A Comparison of Grade 1, Grade 2,
and ITA (a Phonemic Approach)

Total Signs	
	Grade 1
46	The foundation of the fountain is really very strong.
	Grade 2*
26	The foundation of the fountain is really very strong.
	ITA*
34	The foundation of the fountain is really very strong.

* The curved line under groups of letters indicates substitution of a braille symbol.

Two contrasting reading series were used in each approach so that one approach would not be favored by the selection of the reading series. The Scott Foresman The New Basic Readers Curriculum Foundation Series (Robinson, Monroe and Artley, 1965) had been used with blind children. This series stresses the gestalt or learning of whole word forms followed by introduction of basic word attack skills during the readiness program. The emphasis on instantaneous perception of words requires the habit of instant association of sound and meaning with the word forms whose configuration must be learned. The building of a "sight" vocabulary is felt to be important in making progress in reading.

The Lippincott Basic Reading series (McCracken and Walcutt, 1963) was chosen since these readers stress a systematic and orderly approach to reading using mechanical "decoding" skills. Stories are arranged so that they contain only words with the selected letter-sounds. This series stresses beginning with the regular phonics of English spelling. Exceptional words with "unphonic" spellings are introduced after words have been learned that conform to the regular system.

D. Objectives

The general over-all objective of this three year study was to obtain evidence regarding the most effective approach to the teaching of beginning reading to blind children.

During the pilot phase, or period covered by this report, the study was designed to:

1. Develop and field test materials for comparing braille grade 2, braille grade 1 and a phonemic braille using a synthetic and an analytic type basal reader

2. Develop a manual of procedures to guide the teaching of reading in all approaches.

After the conclusion of the pilot study a demonstration phase of two years with a much larger sample would provide more opportunity to evaluate and compare the efficacy of the reading approaches.

Chapter II. Methods

A. Sample

Table 2 shows the schools participating in each method and the number of children who completed the academic year in each experimental class.

Table 2
Participants in Peabody Beginning Braille Reading Project
Number of Children Completing School Year

Series	Phonemic School		Grade 1 School		Grade 2 School		Total
S-F[7]	GMS[1]	8	KSB[2]	4	TSB[3]	4	16
L[8]	VSDB[4]	4	MDSB[5]	11	MOSB[6]	8	23
Total		12		15		12	39

1. The Governor Morehead School, Raleigh, N. C.; 2. Kentucky School for the Blind; 3. Tennessee School for the Blind; 4. Virginia School for the Deaf and Blind; 5. Maryland School for the Blind; 6. Missouri School for the Blind; 7. Scott-Foresman; 8. Lippincott

A total of 16 children who completed the year's program used the S-F[7] series of books and 23, the L[8] series. Twelve children were taught using phonemic codes in the initial phases of instruction; 15, grade 1; and 12, grade 2.

In three of the classes the teachers were working only with children who were in the experimental group; but in three of the schools, the teachers also had other pupils using a different reading mode. In both the Virginia and Tennessee schools the teachers had other pupils reading in large print. In Virginia the large print readers were not using a phonemic alphabet as were the braille readers. In Tennessee, the large print readers had no symbol system identical to the standard braille grade 2 code. In Kentucky, there were children repeating first grade work who were continuing to use the grade 2 braille text books that had been introduced to them the previous year.

Visual Acuity

Visual acuity ranged from 20/200 to total blindness. No data were available concerning near visual acuity but in each case, the school had designated the child for braille instruction. Reference to Table 3 indicates that 20 children, or a little more than half of the sample, had no greater remaining vision than light perception.

Table 3
Reported Visual Acuity of Subjects

Acuity in the Better Eye	Number	Acuity in the Better Eye	Number
Nil	12	5/200 - 10/200	0
Light Perception	8	10/200 - 20/200	6
Hand Movements	1	Undetermined (little)	1
Counts Fingers, 4" - 5"	6	No information	2
2/200 - 5/200	2		

The largest single primary cause of blindness among the participants was retrolental fibroplasia. The incidence of seven cases in the past years was higher than expected in a first grade population. Glaucoma, cataracts, optic atrophy and retinitis pigmentosa were also represented in the group. Other causes were varied as can be seen in Table 4.

Table 4
Primary Cause of Visual Impairment among Subjects

Primary Cause	Number	Primary Cause	Number
Retrolental Fibroplasia	7	Trauma	1
Glaucoma	4	Macular Degeneration	1
Cataracts	3	Chorioretinitis	1
Optic Atrophy	2	Hydrocephalus	1
Retinitis Pigmentosa	2	Microphthalmos	1
Displasia of Optic Nerves	1	Astigmatism, Nystagmus	1
Retinal Degeneration	1	Pigmentary Degeneration	1
Amblyopia	1	Nystagmus, Esotropia	1
Not Reported	8	Hypermetropia, Ocular Nystagmus	1

Prior School Experience

Braille reading is introduced after a year of kindergarten in five of the schools. In one of the schools reading is introduced in the first year to mature pupils, but most children are introduced to braille reading after a year in a kindergarten program.

The amount of prior exposure to educational programs varied widely among the children. Experience included nursery school, kindergarten, headstart, and day school program. Experience also included the residential school kindergarten and programs for multiple handicapped children. Prior school experience varied from no prior experience for 11 children to more than two years of residential school kindergarten for one child as noted in Table 5.

Table 5
Prior School Experience of Pupils

Type of Experience	L-1	L-ITA	L-2	L Total	SF-1	SF-ITA	SF-2	SF Total	Grade Total
No prior experience	3	--	--	3	2	3	3	8	11
Nursery school	--	--	4	4	--	--	--	--	4
*Local school program	2	1	1	4	--	3	--	3	7
1 yr. residential school kindergarten	6	4	1	11	1	1	--	2	13
2 yrs. residential kindergarten	1	1	6	8	1	1	1	3	11
More than 2 yrs. residential kind.	--	--	1	1	--	--	--	--	1

(Some children may be listed in both nursery school and kindergarten.)
* Includes public and private kindergartens, headstart, multiple-handicapped progra

More than one-half of the subjects had participated in some type of educational experience prior to being placed in the beginning braille reading class. Children with the longest periods of readiness would, presumably, be those children with the least ability to master reading skills. Records indicated that some children had entered kindergarten after their sixth birthday.

Age of Participants

Considerable variation was found in age range as can be seen in Table 6. The subjects included one five year old child and three ten year old children although most children were about six to eight years of age. The over-all median age 7.7 years was very close to the median age for each group. The highest median age as well as the largest number having chronological ages over ten was found at the Missouri School for the Blind which used the L series in grade 2 braille.

Table 6
Ages of Pupils Participating

CA in years as of 9-1-67	Number in Class								
				L				SF	Grand
	L-1	L-ITA	L-2	Total	SF-1	SF-ITA	SF-2	Total	Total
5.5 - 5.9	1	--	--	1	--	--	--	0	1
6.0 - 6.4	2	1	--	3	--	--	--	0	3
6.5 - 6.9	2	--	--	2	--	1	--	1	3
7.0 - 7.4	1	--	--	1	2	2	2	6	7
7.5 - 7.9	3	1	2	6	--	1	1	2	8
8.0 - 8.5	2	1	2	5	1	4	1	6	11
8.6 - 8.9	--	1	1	2	--	--	--	0	2
9.0 - 9.5	--	--	--	0	1	--	--	1	1
9.6 - 9.9	--	--	--	0	--	--	--	0	0
10.0 -10.5	--	--	3	3	--	--	--	0	3
Total	11	4	8	23	4	8	4	16	39
Median	7.2	7.95	8.55	7.7	7.7	7.45	7.45	7.7	7.7

Preliminary Tests

Arrangements were made for the Interim Hayes Binet Intelligence Tests for the Blind (Hayes, 1942) and the Roughness-Discrimination Test (Nolan and Morris, 1965) to be administered during the first quarter of the school year. The research associate gave the tests to subjects in two schools while local psychologists who were familiar with the school programs administered these tests in the other schools.

The tested intellectual ability of the children ranged from mildly retarded to high average. IQ scores attained with visually handicapped children may

not accurately reflect innate potential to deal with academic school materials, but experience with these tests indicates that the child's functioning level at the time of administration is usually represented by his test performance. One subject did not respond to testing sufficiently well to attain an IQ score, but he was retained in the experimental reading group due to adequate classroom performance. Although some of the scores were relatively low, classroom performance indicated that these pupils were ready for beginning reading.

The mean IQ for all of the children was 82.667 (S.D.=18.359). The mean IQ for boys was 81.091 and for girls, 84.706. The difference between boys and girls was not significant (t=.605).

Table 7
Interim Hayes Binet Intelligence Test Scores

	Number by Test Series and Reading Method						
	ITA		2		1		
IQ	SF	L	SF	L	SF	L	T
106-115	1	2	--	--	--	--	
96-105	1	--	2	--	--	1	
86-95	1	1	2	2	1	3	
76-85	3	1	--	2	--	4	
66-75	--	--	--	1	--	--	
56-65	--	--	--	2	--	--	
Untestable	--	--	--	1	--	--	
Median	88.5	99.0	97.0	70.0	83.5	77.0	84.0

The children using each textbook series were compared with the other. A Mann-Whitney U test yielded a Z score of 1.450 (p=.0735) which was not statistically significant (Siegel, 1956).

In one group, the teacher expressed some doubt that the test results were an accurate measure of the actual level of ability of one subject. Her judgment was verified when this child mastered reading by the end of the year with a degree of proficiency that would have been most unlikely at the tested IQ.

The Roughness Discrimination Test has been demonstrated to have some predictive validity for beginning braille reading (Nolan, 1960; Nolan and Morris, 1965). It consists of a series of cards with sandpaper of different grits, three on each card being the same and one being different. The difference between the texture of the single block unlike the others varies from gross to fine. The test yields a measure of ability to discriminate tactually.

Many of the children showed a tendency to give stereotyped responses on the Roughness Discrimination Test or no responses at all. This can be seen by the large number of low scores shown in Table 8.

The mean for the group was 36.289 and the Standard Deviation was 19.388. When the sexes were compared, the boys' mean was 41.300 (S.D.=13.174) and the girls', 30.722 (S.D.=23.701). The difference did not prove to be statistically significant (t=1.728).

Table 8
Distribution of Roughness Discrimination Scores

Score	Number of Children
61 - 70	1
51 - 60	7
41 - 50	13
31 - 40	7
21 - 30	3
Below 20	8

Since a sizeable number of subjects from one class did not respond adequately to this test, the test results were of little value in the making of comparisons between reading groups.

B. Preparation of Materials

The materials were prepared in braille for each approach. Pre-primer, primer and first reader books were available in braille grade 2 from the American Printing House for the Blind. Books in braille grade 1 were easily embossed for the project at Howe Press. Books in phonemic braille were much more difficult to prepare. A Scott-Foresman series was already available in ITA in print (Robinson and others, 1965). A braille code was developed to match the ITA symbols (appendix B).

Some symbols such as the "ch", "wh", "th", and "sh" were taken directly from braille grade 2 contractions. The adaptation of a phonemic alphabet into braille required some additional symbols for sounds that were not represented in the braille code. Other symbols were adopted arbitrarily such as the dot 4 preceding a vowel indicated a long vowel sound whereas the vowel standing alone indicated a short vowel sound. Forty-four sound symbols comprised the completed phonemic braille code. No symbol was employed which would be encountered with a different meaning after the pupil made a transition to braille grade 2.

The Lippincott Series was not available in an ITA code in print. The 44 phonemic braille symbols were assigned to the words in this series by

using dictionary pronunciation. Webster's New World Dictionary Elementary Edition (Guralnik, 1961) was used for each word in the Lippincott series. For example, "cheese" was marked "chez". The braille phonemic symbols for "ch", long "e" and "z" sounds were used in the transcribing process. The whole word signs "a", "and", "for", "of", "the" and "with" were used as whole word signs as in braille grade 2. No other contractions were used other than the contractions representing phonemic sounds in the new code. Several modifications were made such as the braille grade 2 contraction for "ing" which was used to represent all "ng" sounds. A dot 4 "th" was used to represent one of the two phonemic "th" signs.

C. Preparation of Teachers

Six experienced teachers of beginning braille readers served as demonstration teacher-consultants in the pilot study. These teachers, located in residential schools for the blind in Kentucky, Alabama , Missouri, North Carolina, Tennessee and Virginia, participated in a three day workshop in July of 1967 to develop principles to be used in all reading approaches in the study. They reviewed the two chosen textbook series, examined the available teaching guides and texts and reached some conclusions concerning the teaching approaches. Reading specialists from George Peabody College for Teachers described a number of different methods of teaching beginning reading. They discussed symbol systems currently employed in establishing experimental teaching programs for beginners and explored reasons for the choices of materials made in this study.

The modifications in the experimental braille codes were explained. Braille specialists discussed general procedures for teaching punctiform reading.

The teachers and research staff explored possible areas of difficulty, testing procedures, information needed about pupils, report forms for individual pupils and lesson plans. Some general agreements were reached by the group in regard to certain teaching procedures - i.e., all agreed to introduce writing along with reading rather than waiting until pupils had acquired some degree of skill in tactual reading.

Selection of groups to use each approach was not random. In some cases school administrators had previously expressed a preference for having a particular approach tried in the school. Teachers from the various schools also agreed among themselves as to preferences of textbook series and symbol system.

D. Teacher Observations

Each teacher maintained daily records for individual pupils and for teaching activities. Copies of these report forms are included in the appendix of this report. Information was requested concerning individual and group readiness activities, introduction of braille symbols, introduction of words, and other beginning reading activities, mastery of writing symbols, and any parallel activities which contributed to the beginning reading program. A progress report on each child and a summary of the over-all

program were prepared. After evaluation of the effectiveness of the report forms, at the end of the first month, daily reports were maintained but only quarterly reports for the pupils and the teacher were submitted during the remainder of the project. Along with the quarterly report forms, teachers also sent samples of materials prepared for use with students and some samples of pupil work. The quarterly reports from the six teachers are included in the appendix.

E. Methods of Analysis

Results were analyzed in two ways. Teachers provided evaluations of teaching procedures, experimental materials and pupil progress. These evaluations were studied and summarized. Results of the Slosson Oral Reading Test and the Gilmore Oral Reading Test administered at the end of the year were compared for each approach considering IQ scores and using a 2x3 analysis of variance with appropriate "t" tests if warranted (Walker and Lev, 1953).

The Gilmore Oral Reading Test (Gilmore, 1952) was individually administered by teachers to all subjects in each group at the end of the year. This test, which consists of a number of paragraphs to be read aloud and timed, provides a measure of accuracy of oral reading and comprehension of material read. Speed of reading was not measured.

The Slosson Oral Reading Test (Slosson, 1963) was also administered by teachers to each subject at the end of the year. This test measures skill in reading isolated words rather than words in context. All can be administered very quickly to children in grades 1 to 8.

Chapter III. Classroom Procedures and Teacher Reactions

Since the teachers from five schools had helped to choose the approach they preferred during the summer conference considerable amount of enthusiasm was generated. One teacher started into the program after the beginning of the school year, but this teacher was interested in the approach and textbook used. Records were maintained on a daily basis for each pupil's activities in reading and the teacher's daily lesson plans. Teachers were enabled to evaluate individual progress on the basis of relatively complete written records.

In every class, teachers prepared adequate supplementary material for teaching reading. The four groups who were using the phonemic codes or using grade 1 braille prepared all supplementary reading materials since no other materials were available.

All teachers displayed considerable skill and ingenuity in devising activities, games, etc. used to interest children and to develop the tactual and auditory skills that would enhance braille reading.

Each quarter every teacher completed a summary showing activities used during that time, reporting on group progress in developing specific reading skills, analyzing problems encountered, etc. Similarly a report was prepared for each child giving information about his readiness activities, acquisition of new symbols and words, number of books introduced, writing of symbols and specific problems this child encountered in reading and writing.

Copies of the forms used in summary reporting are shown in the appendix.

A. Readiness

In preparing children for beginning reading during the first quarter and for new material introduced at each stage of the reading program, a variety of different primary teaching techniques were employed. Many of these were adapted from those normally used in any first grade program. Suggestions in the teacher's manuals for the particular textbook series were sometimes used with needed modifications. Other activities were specifically devised for the particular class and the observed needs of the group and individuals in the group.

Hand and finger manipulatory capacities were trained through numerous games. Tactual exploration of materials was stressed. Every class used the Touch and Tell books (Duncan, 1957) available from the American Printing House for the Blind. Puzzles and manipulatory toys for primary age children were utilized in addition to individual materials prepared by the teachers. Children were given such tactual paper materials as sheets with raised lines to learn to follow a line of dots and cards with exercises in matching symbols. Later words and phrases were similarly presented.

In beginning the year such concepts as "Up-Down", "Top-Bottom", "Left-Right", "Large-Small", and "Big-Little" were taught or reviewed. These concepts were then stressed specifically in relationship to single sheets of braille material and braille books. Children were oriented to the idea of quiet work periods as well as group work and play.

Rhythm games, stories and story telling, and listening to records and tapes were important in developing listening skills. Listening activities became increasingly important in building readiness for new stages of the reading programs as these were introduced. Field trips broadened concepts and vocabularies. For visually impaired children who have often had rather meager chances to explore objects or places outside the scope of the home, field trips were important in giving concrete association for concepts in the reading materials.

In addition to tactual materials, children with even minimum vision were exposed to such visual aids as filmstrips and transparencies. Through these means it was possible to enlarge pictures and forms on a screen and encourage any child with residual vision to trace these tactually. Some students with only a minimum idea of light and dark found themselves able

to follow a broad dark outline on a lighted screen with their fingers, thus gaining some idea of the pictured form.

The element of sound recognition was stressed more in the Lippincott than the Scott-Foresman books, but the ITA edition of the Scott-Foresman series necessitates consciousness of phonemes. All of the classes, however, did introduce phonics in teaching programs and utilized sound games throughout the year to familiarize the children with the associations between sounds and letters and words.

After the first weeks of school the children were well oriented to the new situation and had established good rapport with the teacher as well as among themselves. The readiness program was directed toward preparing the children for the specific unit activities.

B. Supplementary Material and Exercises

Every teacher prepared letter cards, word cards, and braille strips with short phrases and sentences. In the beginning of the reading program, before any new words were encountered in context, they were presented on word cards. Particularly at first, the teachers prepared the cards with clues to orient the children to the card position so that the word or phrase could be read accurately.

Thermoformed materials were used extensively. The Scott-Foresman work books (Robinson, Monroe, and Artley, 1965) were adapted and brailled by the teachers using this series so that the children could use them. The teachers using the Lippincott books also used the Teacher Manuals in presenting new materials. Children were given brailled words, symbols, etc., to match on cards and on work pages. They were shown how to find and mark items on brailled pages as instructed.

In some of the classes, the children did not seem able to cope with a braille copy of the textbook as soon as they were ready to begin reading some of the content. In these cases, teachers prepared individual pages for the child to read and then bound these into booklets that could be taken to their cottage and homes. The children like having such booklets as personal possessions.

Simple three dimensional objects were outlined on cards, identified by the children, and used to match with letter cards. To exploit every bit of residual vision, one teacher found that making transparencies from the work books enabled her to project visual materials to meet the needs of individual children. She could vary the distance and size of the picture for children who could not see them in the print text. Coupling these materials with brailled adaptations of the text, the children could follow activities suggested in the work books. Three dimensional objects were prepared to illustrate beginning sounds and made into booklets in some classes. Alphabet boards and various kinds of chart boards were devised.

Recorded sound drills available from a number of commercial sources were employed in addition to other classroom drills to help students increase awareness of the relationships between sounds and symbols in both writing and reading exercises.

C. Problems Related to New Materials

Whether using grade 1, grade 2, or ITA symbols, certain children in each class had difficulty discriminating certain braille letters. Letters commonly found difficult to differentiate by some children in each group were: "D", "F", "H", and "J", "E" and "I". An examination of the braille alphabet will show that these symbols in braille are mirror images or "up-down" reversals of each other.

Other problems were related to the particular form of braille code or symbol system. In grade 1 braille, the children found it difficult to differentiate words of similar shape and length. Some words that have distinctly different shapes and length in grade 2 braille are made to look similar by grade 1 coding. For example, children found that such words as "This", "The" and "That" were difficult to distinguish. In grade 2 braille, these particular words would have each been represented by a single sign. "What" and "Want" were other similarly shaped words that were misread by some of the children.

Children using ITA materials experienced some reversal problems with such symbols as "U" (⠥) and "M" (⠍). Some of the new symbols made for uneven spacing patterns which at times caused the children to misread the word. In grade 2 braille, some of the signs were confused by the children. Just as "E" and "I" are sometimes mixed up, "en" (⠢) and "in" (⠔) are similarly reversed. Other signs that created difficulty were "of" (⠷) and "with" (⠾), "and" (⠯) and "you"(⠽). When the children making the transition to grade 2 from ITA encountered the lower sign for "to" (⠳), they experienced difficulty recognizing it.

The grade 2 material in the S-F series presented relatively few problems for the children that teachers mentioned, but a number of the children lacked basic concepts needed to utilize the L series to best advantage. It is difficult to interpret such words as "Arab", "blimp" and "bog" to visually impaired children. Since a picture cannot be used to explain the word quickly, it requires more ingenuity and explanation to give these children associations to make some of the words meaningful. These children also encountered difficulties dealing with the concepts needed for homonyms such as "bail-bale" and "deer-dear".

The grade 2 material in both series was more difficult because in transcription of print books in to grade 2 braille at the primer level the introduction of braille signs was not systematic or planned.

The synthetic approach of the L series presented some special difficulties. For example, the word "went" followed "wet", "bent" followed "bet". Since

"en" is somewhat difficult for the children to recognize, the children experienced a particularly difficult problem distinguishing these words from each other. The only time they encountered the "com" sign was in "come" or the "sh" sign was in "she". The low frequency of occurence did not provide sufficient reinforcement. "For" was introduced in "forest" and then did not reappear for over 50 pages.

Another source of confusion in the L grade 2 materials was finding singular forms in the word list, but having to read plural forms in the story. In the singular form all of these words are contracted, but in the plural, they are spelled out. At times when a particular sound is being demonstrated in a lesson and one of the words in braille appears as a sign, the child has no clue to the word. For example, on the "AR" page, the word "part" appears, on the "AI" page, "again" and "paid", and on the "B" page, "But". All of these examples have symbols in grade 2 braille making it necessary for the child to assimilate both a new phonics rule and several new braille signs at the same time in the same lesson.

D. Additional Problems

Limited transitional time was a problem for the four groups using grade 1 and ITA. In neither of the grade 1 braille classes was there time to make the transition to grade 2 braille. In the ITA groups, the teachers felt it was necessary to set up a date to make the transition whether this seemed to be optimum for individual children or not. The desirable time to make the transition would vary from child to child.

Preparation time of supplementary materials for the teachers in the experimental groups was also quite extensive. In addition to the supplementary materials that would normally be made up by the teacher, every paragraph or book read other than the textbooks had to be brailled by the teacher. Before the program is projected for other classes, some supplementary materials should be prepared. While other children could go to the library and get books from time to time, or could compare work in the cottage with each other, those using grade 1 and ITA were not in position to do these things.

E. Teacher Evaluations of Approaches

Three groups in particular found a considerable degree of responsiveness among the children. Those children using the regular grade 2 editions L series available from the American Printing House for the Blind made greater progress in reading than could have been predicted on the basis of their prior test performance. The children using the regular grade 2 editions of the S-F series were also reported to have enjoyed their reading very much and to have made very satisfactory progress. In the S-F series ITA group, the teacher observed that all children seemed to have developed a much greater degree of independence in reading and to have spent more time reading voluntarily than she normally encountered. The teachers reported that all of the classes were highly motivated.

In the ITA L series class, two children made good progress, but two of the children had difficulty. These latter two had more trouble with discriminating sounds and were less oriented toward sounds in relation to words. With only "sound" clues to help identify words and symbols, these children found the program more difficult and had less reading success. To quote the teacher: "I feel very strongly about this method of teaching reading. For those children who have an ear for sounds I could not imagine any other way of teaching reading. But, if a child cannot hear and use sounds, then this is not the method for him."

In the two classes which used grade 1 braille, progress was reported to be slower than in any of the other groups. The teachers felt that the approach was very difficult for the slower and immature children.

The early introduction of writing seemed to be desirable to all of the teachers. The two groups using ITA reported that the children were able to write words as soon as they had learned the symbols associated with the sounds in the word. The one strong point mentioned for beginning with grade 1 braille was the fact that the children seemed to be somewhat better spellers than children who started with grade 2 braille, when performance at the same point in the school year was compared. Writing and reading reinforced each other.

The analytic ITA group developed a higher degree of reading and writing independence earlier than other groups. They enjoyed their work and liked to experiment with writing new words as soon as they learned new sound symbols. The children seemed to experience fewer frustrations with beginning reading than is normally seen. Word attack skills developed in a programmed rather than a haphazard fashion.

Many of the difficulties encountered with introduction of braille signs in grade 2 braille are avoided with the ITA approach. When ready to make the transition, the children did not seem disturbed by the change to grade 2.

The two schools using the ITA materials planned to continue with it during the next school year, and the two schools using grade 2 braille will each retain the same series used in the experiment for the following year. Only those programs using grade 1 braille felt little enthusiasm for further experimentation.

Chapter IV. Findings and Analysis

A. Results

The statistical analysis was limited by the nature of the study. The main purpose of the study was to develop and field test materials to be used in a larger, two-year study.

The data to be analyzed consisted of scores on four variables: mental age, Slosson Oral Reading Test scores, and Gilmore accuracy and comprehension scores. The descriptive data for CA and IQ have been previously discussed under "Sample".

An analysis of variance for mental age shown in Table 9 indicates no significant difference in mental age among the four groups.

Table 9
Analysis of Variance for Mental Age

Source	ss	df	MS	F	F.95
A	47.55	1	47.55	0.71	4.41
B	66.90	1	66.90	0.89	
AB	153.27	1	153.27	2.04	
Error	1,354.58	18	75.25		
Total	1,622.30	21			

The design for analysis consisted of 2x2 cells using treatments of phonemic and grade 2 braille for levels of analytic (Scott-Foresman) and synthetic (Lippincott) reader approaches.

The scores from the synthetic grade 1 group were unusually low and suspect of being unreliable scores to use in the final analysis of data. For instance, all scores obtained from the Gilmore accuracy test were "zero." The range of scores on the Slosson and Gilmore comprehension tests were also very low in comparison to the other groups. This group had been introduced into the study late as a substitute for another group which was unable to participate. For this reason, the scores were dropped from the final analysis along with the scores from the other grade 1 group. The descriptive data for the participating subjects are shown in the appendix. The ranges and mean scores on reading tests are shown in Table 10.

Table 10
Ranges and Mean Scores on Reading Tests

			Slosson		Gilmore A		Gilmore C	
			Range	Mean	Range	Mean	Range	Mean
L-1	Md.	1	1-6	3.30	0.0	--	2-7	4.00
SF-1	Ky.	2	10-41	26.00	4-26	15.00**	4-15	9.00
L-2	Mo.	3	1-118	62.00	2-37	21.57**	0-33	22.13**
SF-2	Tenn.	4	41-47	43.25	15-19	16.75**	15-19	17.25**
L-P	Va.	5	3-50	26.25	1-11	25.34**	3-12	6.50
SF-P	N.C.	6	14-45	29.17	1-35	10.50*	8-29	19.00**

Note: zero scores not included
* average by norms Grade 1.5, Form A
** above average by norms

Certain cautions should be exercised when comparing scores of the groups. The grade 2 groups required no transition between braille codes, and they had adequate supplementary materials. The phonemic groups required a month to six weeks in making the transition to grade 2 braille. The transition required the return to pre-primer level material below the levels reached in phonemic braille in order to learn grade 2 contractions. The grade 1 groups did not have time to study grade 2 braille contractions but tests were administered in the grade 2 medium. Results of grade 2 tests administered to the grade 1 and phonemic groups would probably be much lower than tests administered in the initial codes.

The grade 1 and phonemic groups were also penalized by a lack of supplementary materials. Library material and classroom texts were available only in grade 2 braille. Supplementary materials in grade 1 and phonemic codes were prepared by the teachers. Braille writing which was introduced at the beginning of the year provided reinforcement for teaching of symbols in the codes.

T-tests were performed as noted in Table 11.

Table 11
T-tests of Slosson and Gilmore Scores

	Gilmore C	Gilmore A	Slosson
L_p-L_2	*3.62	*3.11	*2.22
L_p-SF_p	*4.24	0.82	0.26
SF_p-SF_2	0.71	1.46	*2.63

* $p > .05$

Significant differences were obtained at the .05 level of significance in five comparisons.

Differences in mean scores indicated that:

1. the synthetic-grade 2 approach was superior to the synthetic-phonemic approach in all three comparisons, on the Gilmore comprehension and accuracy scores on the Slosson scores

2. the analytic-grade 2 approach was superior to the analytic-phonemic approach in only one comparison using the Slosson scores

3. The analytic-phonemic approach was superior to the synthetic-phonemic approach in only one comparison using the Gilmore Comprehension scores.

In comparison with norms for Grade 1.5-Form A for seeing children (Gilmore, 1952) the following results were noted for group means:

1. both grade 2 groups were above average in accuracy and comprehension

2. the phonemic-analytic group was average in accuracy and above average in comprehension

3. the phonemic-synthetic group was below average in accuracy and comprehension

4. the grade 1-analytic group was above average in accuracy but below average in comprehension.

The disadvantage of using grade 2 evaluation materials can be noted by the following analysis by counting of contracted words in each paragraph:

Table 12
Analysis of Gilmore Paragraphs

Level	Contracted Words	Total Words
1	7	26
2	18	50
3	38	51

For example, a student missing all grade 2 contractions in the first three paragraphs could obtain a maximum accuracy score of three. The score is obtained by subtracting the number of errors from ten. After ten errors are reached, no further count is made since the minimum score is zero.

B. Discussion

The following discussion is drawn from the results of the t-tests and examination of the descriptive data.

1. Synthetic-grade 2 braille approaches appear to be superior to the synthetic-phonemic braille approaches in this one-year trial. The phonemic groups were penalized by using tests in the grade 2 medium at the end of the one-year experiment. A longer transition period may have improved the scores in the phonemic groups.

2. The superiority of grade 2 braille was not as certain in the analytic approach since only one of three tests indicated a significant difference.

The construction of the synthetic-phonemic materials had been more difficult than the construction of the analytic-phonemic materials.

In many cases the phonemic braille code conflicted with the system used in the synthetic reader. There were no conflicts in the adaptation of the analytic reader. (Note previous section in discussion of preparation of materials.)

The superiority of the analytic-phonemic approach over the synthetic-phonemic approach was further indicated by the significant difference obtained with the Gilmore comprehension scores.

3. The effectiveness of the grade 1 braille approaches was not fairly tested. MA's for subjects in one group using grade 1 braille were considerably lower than MA's from the other schools as can be noted from the raw data in the appendix. Not one of the subjects in one school had an MA above 6-4. Only six of the remaining 29 subjects in the other groups had MA's at 6-4 or below. The relatively low performance of this group of children may have been a function of lower mental maturity.

   The scores of the second grade 1 group compare favorably with the scores in the other groups. The subjects may also have been penalized due to the short transition period from grade 1 to grade 2. It should also be noted that phonemic and grade 2 teachers appeared to be more highly motivated by the media than the grade 1 teachers. In the beginning of the study it was very difficult to find schools that would try grade 1 braille, an old system that had been discarded in favor of grade 2 in practically all schools for the blind.

4. Neither the synthetic or the analytic approaches showed any overall superiority. In comparison with standard norms for seeing children, grade 2 groups in both approaches performed "above average" to "superior" on the Gilmore tests.

C. Conclusions and Recommendations

1. Positive teacher reactions indicated that all approaches using grade 2 or phonemic materials were received with enthusiasm. The late start of a grade 1 group and low MA's of subjects in this group may have contributed to the lack of enthusiasm for grade 1 in that group.

2. Phonemic materials were developed and used successfully as measured by the results of the Gilmore and Slosson reading tests. Further exploration of such materials certainly seems warranted.

3. The early transition to grade 2 and subsequent testing in the grade 2 medium favored the grade 2 approaches. A longer transition period should have improved the scores in the grade 1 and phonemic groups.

4. Appropriate and sufficient additional materials should be prepared in ITA and grade 1 braille to supplement the basal readers. Insufficient materials in these media could handicap subjects not using the traditional grade 2 materials. Transitional materials should be designed for phasing out the experimental codes and introducing the grade 2 contractions.

5. The analytic reader is apparently more adaptable to the phonemic approach than the synthetic reader. In future studies phonemic braille should be used with the analytic approach. The randomization of subjects in a study comparing phonemic braille, grade 1 and grade 2 braille in an analytic reader seems warranted. The limited number of beginning readers could be concentrated in three approaches rather than in six approaches.

6. The use of sound and speech discrimination tests could be used to help determine the feasibility of using phonemic materials with beginning children. Phonemic materials may be especially suitable for certain children.

7. An analysis of the phonemic braille code may be appropriate. The braille symbols for sounds could be studied for the most effective arrangement of data and for the least confusion in making a transition to the braille 2 system. Tachistoscopic methods could be used to determine variations in time required to learn various tactual representations of phonemics.

8. A study of longer duration with more subjects and more adequate materials is necessary to make generalizations concerning the efficacy of approaches in braille reading.

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Appendix A

Raw Data

N	Media	Sex	CA	IQ	MA	*RD	**SL	***GA	****GC
1	L-1	M	70	100	70	37	3	0	4
2	L-1	M	72	94	68	46	4	0	2
3	L-1	M	80	93	74	41	5	0	5
4	L-1	M	79	89	70	51	6	0	3
5	L-1	M	91	79	72	47	3	0	4
6	L-1	F	86	77	66	46	3	0	3
7	L-1	M	94	77	72	53	4	0	5
8	L-1	F	73	75	55	0	1	0	3
9	L-1	M	102	75	76	50	2	0	4
10	L-1	M	94	73	69	24	0	0	4
11	L-1	M	104	69	72	33	2	0	7
12	L-P	F	90	111	96	63	3	0	5
13	L-P	F	76	108	80	28	50	7	12
14	L-P	M	104	90	94	53	18	1	3
15	L-P	F	98	82	80	57	34	11	6
16	L-2	F	98	90	88	50	79	25	28
17	L-2	F	98	88	86	48	76	24	30
18	L-2	F	94	83	76	0	1	0	0
19	L-2	M	107	75	80	0	66	22	20
20	L-2	F	120	65	78	0	118	37	33
21	L-2	F	120	60	72	0	63	18	28
22	L-2	F	120	59	74	0	25	2	13
23	L-2	F	95	--	--	0	68	23	25
24	S-1	F	97	85	82	47	19	4	8
25	S-1	F	89	88	78	45	41	26	15
26	S-1	M	84	82	69	--	34	15	9
27	S-1	M	112	80	90	28	10	0	4
28	S-P	F	96	106	104	53	39	35	29
29	S-P	M	84	99	84	38	45	20	21
30	S-P	F	90	94	86	37	14	1	8
31	S-P	M	99	93	94	54	--	1	20
32	S-P	M	100	84	86	48	37	11	24
33	S-P	F	91	81	76	33	21	8	19
34	S-P	M	101	75	78	50	--	2	15
35	S-P	M	98	73	74	54	19	6	16
36	S-2	M	89	100	89	52	43	19	19
37	S-2	M	96	100	96	49	47	18	19
38	S-2	M	92	94	87	38	42	15	16
39	S-2	F	85	88	75	46	41	15	15

* RD - Roughness Discrimination
** SL - Slosson Reading
*** GA - Gilmore Reading - Accuracy
**** GC - Gilmore Reading Comprehension

Appendix B

Phonemic Braille Code for Lippincott Series

Symbol	Braille Symbol	Example	Dictionary	Braille
a	a	at	at	at
ā	(dot 4)a	gate	gāt	g(4)at
*ä	(dots 4,5)a	was	wäz	w(4,5)az
e	e	get	get	get
ē	(dot 4)e	eat	ēt	(4)et
i	i	it	it	it
ī	(dot 4)i	fine	fīn	f(4)in
*o	o	not	not	not
ō	(dot 4)o	no	nō	n(4)o
o͞o	(dots 4,5)o	to	to͞o	t(4,5)o
oo	(dots 4,5)u	book	book	b(4,5)uk
ou	ou	house	hous	hou̲s
ow	ow	cow	kow	kow
u	u	up	up	up
yo͞o	(dot 4)u	mule	myo͞ol	m(4)ul)

* Be guided by original spelling. If original spelling is o, use o. If original spelling is a, use (4,5)a except when a is followed by w, then use original spelling.

Examples, order - ôrder - order
water - wôter - w(4,5)ater
saw - sô - saw
war - wôr- wawr

th	th	thin	thin	thin
th	(dot 4)th	then	then	(4)then
schwa	u	alone	alōn	ul(4)on

Appendix B.

Whole words and part-word contractions

a

I

and

for

the

Part-word contractions

ar (when "a" was followed by r)

ed (schwa or u followed by d in root word, or when suffix is pronounced as a definite syllable as hunted)

er (short e followed by r)

ch

sh

st

wh (this was used, though dictionary used hw
Ex.: while -- hwil -- whil)

ing (used for ng soung)

As a general rule, when the dictionary gave more than one pronunciation, the one nearest to original spelling was used.

Appendix B

Phonemic Braille Code for Scott-Foresman Series

a	æ	ɑ	au	b	c	ch
at a	ate 4a	arm 4 a 5	all 4 5 a	bed b 1,2	cat c 1,4	chap ch 1,6
d	e	ɛɛ	f	g	h	i
dog 1,4,5	elm 1,5	even 4 e	fox 1,2,4	go 1,2,4,5	hat 1,2,5	it 2,4
ie	j	k	l	m	n	ŋ
ice 4 i	jug 2,4,5	kite 1,3	like 1,2,3	mad 1,3,4	note 1,3,4,5	ring 3,4,6
o	œ	ω	ωω	ɔi	ɔu	p
on 1,3,5	over 4 o	took 4,5 u	soon 4,5 o	oil 1,3,5, 2,4	out 1,2,5,6	put 1,2,3,4
r	ɾ	s	ʂ	ʃh	ʒ	t
run 1,2,3,5	her er	sit 2,3,4	is 1,3,5,6	shoe sh 1,4,6	measure zh	top 2,3,4,5
th	ʃh	u	ue	v	w	wh
thin th 1,4,5,6 (voiceless)	then 4 th (voiced)	up 1,3,6	use 4 u	vase 1,2,3,6	web 2,4,5,6	what wh 1,5,6
y	z					
yet 1,3,4,5,6	zip 1,3,5,6					

Whole words and whole-word contractions

a	a
I	I
and	and
for	for
the	the

Fig. 3. The Initial Teaching Alphabet of 44 sound-symbols.

er her
1,2,4,5,6 e,er(sign)
girl ɪ, er (sign)
work u, er (sign)

Appendix C

PEABODY BRAILLE READING PROJECT INDIVIDUAL DAILY RECORDS

CHILD'S NAME _____ SCHOOL _____

DATE	READINESS ACTIVITIES	WRITING ACTIVITIES	NEW WORDS INTRODUCED	READING ACTIVITIES

Appendix C

EXPERIMENTAL BRAILLE TEACHING PROGRAM
INFORMATION ON CHILDREN

SCHOOL_____ TEACHER_____

CHILD_____ BIRTHDATE_____

DATE OF ADMISSION TO THE CLASS_____PRIOR SCHOOL EXPERIENCE_____

DIAGNOSIS OF VISUAL IMPAIRMENT_____

VISUAL ACUITY DISTANCE: RIGHT EYE_____ LEFT EYE_____
NEAR (IF AVAILABLE) RIGHT EYE_____ LEFT EYE_____

ADDITIONAL SIGNIFICANT INFORMATION: (Include information on any prior school experience including nursery school and kindergarten)_____

_____

_____

_____

- - - -

Appendix C

PEABODY BRAILLE READING PROJECT

TEACHER'S ACTIVITIES

TEACHER _____
SCHOOL _____
QUARTER _____

SUMMARIZE READINESS PROGRAM FOR ALL THE CHILDREN (PLEASE ATTACH COPIES OR DESCRIBE ANY IDEAS YOU DEVISED THAT WERE EFFECTIVE.)

DESCRIBE ANY SUPPLEMENTARY READING EXERCISES OR BOOKS
(SEND COPIES OF EXERCISES IF POSSIBLE.)

DESCRIBE YOUR REACTION TO THIS APPROACH TO TEACHING READING AS OF NOW.

ARE PUPIL'S PROGRESS COMMENSURATE WITH YOUR EXPECTATIONS AT THIS TIME.

LIST FREQUENT ERRORS OR CONFUSIONS OF STUDENTS

OTHER PROBLEMS:

Appendix C

GILMORE & SLOSSON SCORING SHEETS

CHILD'S NAME_____ SCHOOL_____

FORM: A_____ B_____ DATE_____

SUMMARY CHECK LIST

_____ MANY SUBSTITUTIONS
_____ HABITUAL MISPRONUNCIATIONS
_____ MANY WORDS PRONOUNCED BY EXAMINER
_____ HABITUAL DISREGARD OF PUNCTUATION
_____ HABITUAL INSERTIONS
_____ " HESITATIONS
_____ " REPETITIONS
_____ " OMISSIONS
_____
_____
_____
_____ WORD-BY-WORD READING
_____ READS IN MONOTONE
_____ STRAINED, HIGH PITCHED VOICE
_____ VOLUME TOO LOUD
_____ " " SOFT
_____ POOR ENUNCIATION

TEST SUMMARY

PARAGRAPH	ACCURACY		COMPREHENSION		TIME
	ERRORS	10-No. ERRORS	No.	RIGHT	
1					
2					
3					
4					
5					
	GRADE EQUIV.		No. RIGHT		
	RATING				

SLOSSOM ORAL READING TEST

SCORE

LIST 1 _____
" 2 _____
" 3 _____
" 4 _____
" 5 _____
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TOTAL RAW SCORE _____

PARTICULAR PROBLEM WORDS?

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READING GRADE LEVEL_____

Appendix C

APPROACHES TO TEACHING BRAILLE

Program
July 27 -28 1967

Special Education Conference Room

8:30 - 9:30	Introduction to Project	R. Harley
9:30 - 10:00	Reading Research	S. Ashcroft
10:00 - 10:30	Break	
10:30 - 11:30	Overview of Methods in Reading	R. Woodcock
11:30 - 1:00	Lunch	R. Harley
1:00 - 2:00	Introduction to Materials	R. Harley
2:00 - 3:00	Braille Teaching Procedures	F. Henderson
3:00 - 3:30	Coffee Break	
3:30 - 4:30	Evaluation, Pre-tests Records	R. Rawls
8:00 p.m.	Social	R. Harley

July 28, 1967

8:30 -10:00	Mechanics of Project, Reporting Communication, Getting Material, etc.	R. Harley R. Rawls
10:00 - 10:30	Break	
10:30 - 12:00	Continuation of 8:30 Session	Harley, Rawls
12:00 - 1:30	Lunch	
1:30 - 2:30	Summary and Special Questions	R. Rawls

END

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